which they are founded, are naive about measurement and scaling, so that concepts such as reliability and validity are ignored or else thrown down and danced upon. Many of Hammond and Knott's astute observations about the perils of ranking program packages in ZBB, would fit easily under the reliability, validity and generalizability rubric, with a resultant gain in theoretical power and explanatory value. Concepts such as multi-operationism, construct validity, discriminant and convergent validity, inter-rater agreement, time-to-time instability in ratings, generalizability to the *UTO, Cronbach's concept and rater bias, could be used to critique the formalistic decision models to which these writers object.

Substantive social theory is also relevant. One classic basis for the analysis of rater bias—a major problem with ZBB—is to be found in Mannheim's

Ideology and Utopia. The work of Hammond and Knott, unlike that of the formal modelers, is consistent with the methods and findings of the sociology of knowledge, and evaluators and policy analysts might well consider grounding their work more explicitly in that tradition, as Myrdal has done in *Asian Drama,* and as Irwin Deutscher and Robert Bogdan do by way of the social interactionist perspective on the creation of knowledge.

Each reader will have his or her own suggested extensions of the argument of Hammond and Knott's stimulating book. A perceptive inquiry into ZBB in particular, and into the relation between planning and budgeting more generally, this book will be a distinct help to evaluators, managers, and others who struggle with the task of deciding how much to spend on what.

Inner Contradictions of Rigorous Research, Chris Argyris. *New York: Academic Press Inc., Publishers, 1980, 203 pp., $18.50 (hardcover).*

Reviewer: Leonard Bickman

Argyris raises a number of critical points concerning research methodology that, if accepted, can have a powerful effect on the way evaluations are conducted. The most significant implication of his perspective, however, concerns the potential utilization of evaluation results.

This book is part of the Organizational and Occupational Psychology series of Academic Press and thus was not targeted at the evaluation community. The reader will not find many of the luminaries of evaluation cited, although the book is aimed at the broad field of applied social science. Those familiar with Argyris' previous writings and organizational research in general will find the book easier reading than those not familiar with many of the concepts that are not adequately defined.

Argyris starts with the everyday observation that plumbers and electricians are skilled in these areas off the job as well as while on it, but social scientists do not appear to be more skilled socially than individuals in other occupations. I am sure that we all have anecdotes concerning the insensitive (and maybe a little crazy) psychologist. To Argyris, this observation indicates that we are not able to directly apply many social science findings to everyday life. In searching for this apparent gap between research and everyday application Argyris indicts the rigorous research procedures that most social scientists use.

The rigorous methods (i.e., experimental, quantitative) used in "normal science" requires unilateral control by the researcher which results in dependence

and a limited time perspective in the subject. Moreover, quantification requires a level of abstraction that loses the everyday meaning of subjects' experience. Ayrgris believes that rigorous methodology creates an unnatural separation between the subject and the investigator.

Argyris' arguments are similar to criticisms we have heard before. Rigorous, laboratory oriented and quantitative research contain threats to external validity that reduce their generalizability. These criticisms are over 20 years old (Brunswick, 1955; Orne, 1962) and are still being debated. What Argyris adds to the argument is his concept of "action science."

Normal science, as Argyris describes it, is appropriate for describing the social environment as it exists but action science strives for the creation of a higher quality of life. If applied research is in fact to be action science then the rigorous methodology of normal science will not lead to significant improvement since it is status quo oriented. The results of these methods do not inform action for important issues.

Argyris further argues that most behavior can be described as Model I behavior; that is, behavior that is characterized as defensive, single loop, camouflage oriented, inhibiting, and lacking candid communication. This also describes the rigorous research procedures of normal science. Thus, while normal science might accurately reflect Model I behavior it cannot lead to the more desired Model II behavior.

Model II behavior is described as double loop (i.e., it contains feedback loops that are corrective of the

governing values of the system, non-defensive and which provide informed choice). Argyris believes that in order to improve the quality of life we must operate in the Model II mode. Unfortunately, almost everybody is unaware that they operate at a Model I level. Argyris further differentiates between theories-in-use and espoused theories. While most espouse Model II behavior, they actually behave according to Model I.

If the results of an applied social science are going to be used to improve the quality of life, they must be used in a Model II context. Research findings, in order to be incorporated in an action, must be implemented by Model II individuals or organizations. Moreover, in order to be applicable, the data must be collected in a Model II rather than a Model I procedure. Model I research simply describes the current universe and not the improved alternative. Thus, the rigorous Model I research methodology cannot be used to provide an alternative or improved description of reality. For Argyris, this connection ties research methodology to potential for change.

The path to a more meaningful life appears clear. We need to operate in and conduct research following Model II principles. But what does Argyris say about our ability to accomplish this? "Results are pessimistic about the potential of individuals and organizations for creating double-loop learning and changing in substantial ways" (p. 119). It is difficult to learn Model II behavior because we are programmed with Model I; we behave according to Model I without awareness.

Results of rigorously conducted evaluations, as they apply to everyday life (not policy), will continue to support the status quo and not result in any significant organizational change. People in Model I will not develop a true self-evaluating organization using data collected using Model I methodology. Thus, Argyris describes a pessimistic picture of the ultimate worth of applied research strategies like rigorous program evaluation to truly improve the quality of life.

Argyris recognizes the limitations of his approach. The models are not comprehensively described (or very clearly defined) nor is there an adequate research base to support them. He notes that only a few social scientists support his perspective and that most of them are at the espoused level of analysis and are not conducting any empirical research. "Hence the data base that is so urgently needed remains lacking" (p. 120).

There are a number of issues that Argyris raises that should at least make evaluators think twice about applying the rigorous procedures. However, I am not optimistic that this book can create anything other than a higher level of awareness. The book does not provide any simple way to conduct Model II type research. To the critical reader, the book will lack the research support for the radical position taken by Argyris. Most of the supporting evidence appears to be anecdotal in nature. Moreover, there are not enough examples to help explain the author's meaning. Finally, there is some difficulty in being able to fairly evaluate this book. Since I am most likely programmed in Model I, I am not able to accurately perceive all of Argyris' points nor do I have the facility to accept the data he presents to support his models. To some, it might appear that Argyris is simply creating a new mystique. This kind of mystique is similar to that which is created when others profess to know the causes of your behavior when you are not aware of them. To others he offers a vision for applied social science that appears to fit well with the movement towards qualitative program evaluation.

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